The Effects of Using Flashcard Learning Media to Improve Reading Comprehension in Children with Dyslexia

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ARTICLE INFO	ABSTRACT
	Dyslexia is a specific learning disability characterized by difficulties in reading. Problems with phonological and reading difficulties is frequently found in elementary students. This study aims to examine the effectiveness of flashcard learning media in improving reading comprehension between ages 8 and 11 in the group of children identified with dyslexia. The current research used one group experimental design with five children as participants. Based on the results of the study, showed that there was an influence of flashcard learning media on improving the reading ability of dyslexic children. The results of data analysis using t-test showed that the post-test score (M=20,8) was significantly higher than the pre-test score (M=10,4). Analyses of the whole sample indicated that levels of reading comprehension had improved. The finding of this study could be discussed that using flashcard learning media had a positive effect on reading comprehension in dyslexia children. The Flashcard media were designed colorful and easy to understand could stimulate children's willingness to learn and read.

Introduction

One of the necessary aspects of children's development is language development. Language is the ability to communicate with others (Yusuf, 2007). According to Bromley (Dhieni, Fridani, Yarmi & Kusniaty, 2008), there are four types of language: listening, speaking, writing and reading. Reading comprehension is a fundamental skill for children to begin their academic experiences. Reading is a window into the broader sciences and knowledge. However, children with poor reading comprehension will need help receiving such information from books.

Iskandarwassid and Sunendar (in Cahyani, 2018) stated that reading is a purposeful activity to understand what has been written in that text. In addition, to reach the goals of the reading activity, the reader must activate various mental processes of the cognitive system. Therefore, the ability to read becomes one of the most essential factors in every person's life. Reading requires interactive abilities where the reader gives meaning based on the background of his experience so that there is an interaction between the reader and the

reading (Afangideh & Jude, 2012). However, there is one who needs help with reading fluently. People who are struggling to read may be an indication of a learning disability. Learning disability is an actual condition that we can observe through the learning process or children's learning activity (Widyorini & Van Tiel, 2017).

Children with learning disabilities usually have normal to high intelligence and make constant mistakes in the learning process. There are three common learning disabilities: dyslexia, dyscalculia, and dysgraphia (Scaria, Bhaskaran, & George, 2023). Children who cannot manage their condition may negatively affect their academic performance. Children with learning disabilities need treatment and intervention to solve their learning problems and prevent academic failure (Snowling, Hulme, & Nation, 2020). The concern of this study is a specific learning disability known as dyslexia. Not only do they have difficulty reading, children with dyslexia usually have problems in counting and writing.

Dyslexia is a learning disability that includes difficulty distinguishing between letters, numbers, symbols, or punctuation marks used in sentences, recognizing words, and reading (Widyorini & Van Tiel, 2017). Dyslexia is a disorder that focuses on the nervous system, where a child may have trouble reading, writing, spelling, or recognizing letters. Other accompanying symptoms may include difficulty counting, writing numbers, and coordination/motor function (Munawaroh & Anggrayni, 2015). The International Dyslexia Association (Martinez, Ramos, Callaway, and Miller, 2014) states dyslexia as a specific learning difficulty originating from neurological factors, characterized by difficulty recognizing words and poor ability to recognize words, spelling, and the ability to distinguish between letters and words. The World Health Organization (Beech, 2013) describes dyslexia as a specific disorder in reading but not related to mental disorders and visual acuity problems.

The British Dyslexia Association (Reid, 2011) suggests that there are several indications that children with dyslexia include 1) having difficulty differentiating sounds, 2) being inattentive, 3) being unable to distinguish sounds, and 4) having a history of slow speech development. Indonesia has a prevalence of dyslexia that cannot be known with certainty. However, Masroza's research (2013) results showed that 59% of students in 24 elementary schools in Pauh Padang District needed help learning to read. In addition, a survey from The Program for International Student Assessment (PISA) in 2018 in the literacy category showed that Indonesia was ranked 74th out of 79 countries with an average score of 371. This means Indonesia is below all countries' average reading ability scores (Schleicher, 2019).

Children with dyslexia require different stimuli than their classmates need. Since dyslexic children experience reading difficulties, they need special treatment to achieve learning outcomes optimally (Prasetyaningrum et al., 2022). Children with dyslexia have deficits in processing and remembering information, which probably affect their learning ability (Gu & Bi, 2020). They also have difficulty with short-term and working memory, meaning they struggle to hold more than one or two points in their head at one time. The memory

problems may cause problems in reading, spelling, and written language as well as difficulties in letter identification (Hulme & Snowling, 2016).

In fact, there are limited intervention programs for children with dyslexia, especially at school in Indonesia. The teachers mainly focus on improving academic skills such as reading and writing use traditional method in teaching (Yuzaidey et al, 2018). The traditional learning method is not effective for children with dyslexia because it tended to be stereotypical, teacher-centered and passive. This study uses flashcard as learning media to improve reading ability of dyslexic children. The reason for using flashcards is because they help to deliver information in short-interesting content through colorful words or images and simple to use in learning practice activities. This supports children with dyslexic build visual association with certain facts or words (Puradireja, 2022). Flashcards are familiar tool used in language learning, especially in learning, understanding, and memorizing letter shapes, sounds, and vocabulary (Wen et al., 2020).

Hatiningsih and Adriyati (2019) in their research showed that there was an increase in initial reading ability after being taught using flashcards. Flashcard media are picture cards with corrected words. The images on the index card are into series, such as animals, fruits, colours, shapes, alphabets, numbers, occupations, etc. The cards are played by showing them to the child and scanning them just seconds per card. However, for dyslexic children, the cards are made with simple sentences that are easy for dyslexic children to understand. It is to increase. Mulyadi and Nurhadayani (2018) added that flashcard media can improve students' reading skills quite significantly.

Based on the background of the problem, the researcher is interested in seeing the effectiveness of flashcard learning media in improving reading skills in dyslexic children. This study aimed to determine whether the use of flashcard learning media can improve reading skills in dyslexic children. While the benefits of this research are as reference material for future researchers who are interested in researching dyslexic children, besides that, this research can help therapists or psychologists who will implement interventions for children with learning disorders like dyslexia. The hypothesis in this study is that there are differences in reading ability in dyslexic children before being given the flashcard learning media intervention and after getting the flashcard learning media intervention. Children's reading ability is better after getting the intervention than before getting the intervention.

Research Methods

Types of research
This study uses a quantitative approach with an experimental method that is validation or tests a certain concept or procedure to prove whether the concept or treatment affects the results or the dependent variable significantly. Researchers can find out the causal relationship between the variables studied. Therefore the variables tested must be measured using standardized measurement instruments or tests (Dyah & Bandur, 2018).

Participant

The population in this study were dyslexic children at a special school for dyslexia in Central Java, Indonesia. At the same time, the sample in this studied was taken from 5 children with learning disorders, dyslexia, who will be given an intervention using flashcard learning media. The sample is part of the population used as research subjects (Azwar, 2000). The sampling technique in this study used a purposive sampling method to determine the subject. Sugiyono (2017) states that purposive sampling is based on data sources with certain considerations. Subjects in this study had the criteria of age 7-9 years where they were still in elementary school, had learning difficulties reading or dyslexia, and were ready to be given intervention using flashcard learning media.

Data collection method

The data collection method in this study was carried out using experimental methods through interventions using flashcard learning media to improve reading skills. The design carried out in the implementation of this study used the one-group pretest-posttest design model, namely research carried out by taking initial measurements, which were then given treatment to subjects in one group and then measured again using the same tool (Seniati et al., 2011). The data collection method in this study was carried out using experimental methods through image visualization to improve reading skills.

The image visualization used in this study uses flashcards equipped with letters, words, and sentences to stimulate reading skills. Implementing the research carried out in several stages:

1. The first stage is to carry out a pre-test to determine reading ability in children with dyslexia using intelligence tests on verbal abilities.
2. Apply customized flashcard learning media for 4 meetings to stimulate and train reading skills in dyslexic children.
3. Implement a post-test to determine the effect of flashcard learning media on the reading ability of students who experience dyslexia.

Data analysis method

The method of data analysis is the processing of data derived from data obtained from various sources that have been collected using certain methods so that they can be used to conclude. In this study, the data analysis method used was the T-test analysis technique using SPSS 26 for Windows. In this analysis, the pre-test and post-test were compared after the children were given stimulation using flashcard learning media.

Findings

Flashcards are one of the learning media used to improve reading comprehension. This includes the reading ability of dyslexic children. The Dyslexia School in Kudus has many children who are dyslexic and have learning disabilities. The school aims to help dyslexic children practice reading. Developing reading comprehension in children with dyslexia requires appropriate learning to optimize their skills. This is consistent with Sohibun and

Ade (2017) argues that for children's maximal learning, the learning medium must match the child's characteristics.

This research distributed questionnaires to dyslexic children at the Dyslexic School in Kudus who had learned to use flashcard media in their learning media. The results of data analysis from filling out the questionnaire using the T-Test on the pretest and post-test instruments that researchers have carried out through the screening process for children with dyslexia it can be seen in tables 1 and 2 below:

Table 1. Pretest Recapitulation Value

No	Name	Score			Total
		Reading Assessment	Reading Comprehension	Reading Use	
1	AN	6	3	2	11
2	SU	6	3	3	12
3	TI	6	3	2	11
4	RU	3	3	3	9
5	PA	4	3	2	9
	Average				10,4

Table 2. Posttest Recapitulation Value

No	Name	Score			Total
		Reading Assessment	Reading Comprehension	Reading Use	
1	AN	8	7	6	21
2	SU	8	7	6	21
3	TI	8	6	7	21
4	RU	7	7	5	19
5	PA	7	8	7	22
	Average				20,8

Based on tables 1 and 2 above, it can be seen that there was an effect of changes in reading after the researchers used flashcard media to help improve the reading ability of dyslexic children at the Dyslexia School in Kudus. Changes can be seen from the mechanical aspects and aspects of understanding possessed by dyslexic children.

In this study, dyslexic children expressed interest in reading on flashcard media because they were interested in colours and images that facilitated their understanding of the text. It was consistent with Sunanih's opinion (2017) stating that doing helps children understand the texts they read. This study uses her three stages in delivering learning using flashcard media. The first use flashcards in the form of letters, the second contains readings by syllables, then distinguishes between colours and tasks, and finally, flashcard media related to assembling words into paragraphs. It includes both the mechanical and comprehension aspects of the child. Below is a comparison of the pretest and posttest score charts.

Figure 1. Average Pretest and Posttest results

AVERAGE READING ABILITY TEST RESULTS FOR DYSLEXIC CHILDREN

	Pretest	Posttest
■ Avarage	10,4	20,8
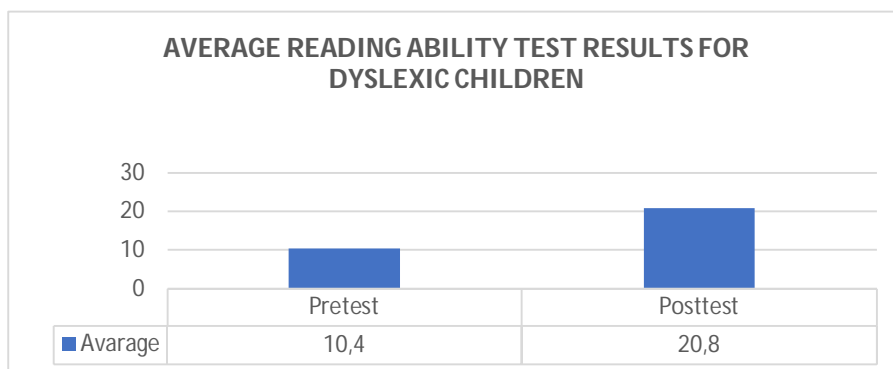
After confirming differences between pretest and posttest results in the processing of training using flashcard media, hypotheses were tested using T-tests performed using the SPSS version 26.0 program, The following results have been executed:

Table 3. Paired T-Test Results

	Groups	N	Mean	Std. Deviation	Std. Error Mean
Result	Pretest	5	10.40	1.342	.600
	Posttest	5	20.80	1.095	.490

Tabel 4. Uji T-Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Results	Equal variances assumed	1.020	.342	-13.426	8	.000	-10.400	.775	-12.186	-8.614
	Equal variances not assumed			-13.426	7.692	.000	-10.400	.775	-12.199	-8.601

Based on the results of the T-Test that the researchers carried out, it can be seen that there were very significant differences in dyslexic children before being given treatment with flashcard learning media and after being given treatment with flashcard learning media. This is evident from the results of data processing which shows a significance level of P 0.000 <.001 where these results mean that there are differences in pretest and posttest results in dyslexic children. Seeing these results proves that learning activities will be more successful if using the right learning media compared to learning without using media or learning models that are less attractive.

Discussion

Reading comprehension is a complex task that depends on various cognitive and linguistic processes (Nation, 2019). The dyslexic brain has poor cerebellum activation and phonological processing (Tambirajah, 2010). Because of these conditions, children with dyslexia experience difficulties in language areas, reading, writing, and memory. This research represents tremendous progress in examining flashcard media learning to improve reading comprehension in children with dyslexia.

Media is one of the tools to deliver and describe information. The media used in teaching activities refers to visual and audio learning media (Arsyad, 2011). Flashcards are a learning media that can help children to improve their reading skills. Arifani et al. (2020) explained that the contents of the flashcards were adjustable for any age, and academic level, such as elementary, middle or high, according to the children's needs. Using flashcards as learning media help teachers to provide appropriate learning materials for children according to their abilities or cognitive levels to facilitate children with dyslexia achieve the learning targets. Another statement from Panastuti (2017) explains that flashcard media delivers short vocabulary with images and colours, which helps children read and learn vocabulary more quickly.

Dyslexia is a learning disability characterized by difficulties with word-level skills. Students with dyslexia need focused instruction to build their reading skills. Flashcards are helpful learning strategy for children with poor reading conditions (Puradireja, 2022). Some research proved the effectiveness of using flashcards to enhance reading skills and academic development in dyslexia children. The previous studies, Mulyadi & Nurhadayani (2018) and Insiyah et al. (2021) stated that flashcards were effectively improving children's reading skills. Hence, the reason that flashcards were learning media with short vocabulary, colorful font, and pictures. This is appropriate with the cognitive stages of elementary-age children's development and help create a fun learning process.

Early on, children with dyslexia also experience reading problems such as slow reading speed, a high proportion of errors and inaccurate reading (Stevens et al., 2022). Therefore, the dyslexic brain needs more repetition practice to record the words and concepts until they become permanently ingrained. Through repetition using flashcard

media learning, the new terms or vocabulary will become familiar and facilitate children with dyslexia to recognize them without any trouble reading.

This study found that using flashcard increase the interest of reading activity. Magfiroh and Bahrodin (2022) stated that flashcard media is media that has a good influence on the reading ability of dyslexic children. The study results show that flashcard media can increase interest in reading in dyslexic children. This is because this media contains many colours and attractive images. Giving it to children can also be used as material for guessing games with children so that learning becomes enjoyable. This is the opinion of Panastuti (2017), which explains that the colours and images available on flashcards can attract interest in learning to read in children. Sukartiningsih (2014) explains that learning to read using flashcard media is a method by educators using serial or picture cards or letter cards to improve children`s reading learning.

The current study's finding has implications for giving academic intervention to students or children who struggle with reading. Flashcards can be one of the different learning strategies that work to help students or children with dyslexia.

Conclusion

Based on the results of the studies conducted, we show that flashcard media treatment for dyslexia in children is effective and efficient. The use of flashcard media with symbols, pictures, and easy-to-understand colorful letters has a positive impact on changing reading skills in children with dyslexia. Data analysis results show a strong effect of flashcard media on reading comprehension in dyslexic children.

We suggest that future researchers use other media to improve reading comprehension in children with dyslexia. There are many exciting learning media to arouse children's interest in reading and improve reading comprehension in children with dyslexia.

References

Afangideh, M.E & Jude, W.I. (2012). Developing Literacy Skill To Enhance Academic Performance of Learners in UYO Education Zone. Academic Research International. Journal Social Sceince Humanities. Vol.3. No.3.

Arifani, G. I, dkk (2020) Pengembangan Media Permainan Sains Feed The Zoo Animal Berbantu Flash Card untuk Menfasilitasi Kemampuan Mengenal Huruf. Jurnal PAUD Agapedia, Vol.4 No. 1.

Arsyad, Azhar. (2011). *Media Pembelajaran.* Jakarta: PT. Raja Grafindo Persada

Beech, J. (2013). The Little Book of Dyslexia. Wales-British: Independent Thinking Press.

Cahyani. F., D. (2018). Efektivitas Penggunaak Media Flash Card Untuk Meningkatkan Kemampuan Membaca Siswa Kelas 1 Di SD N 02 Ngroto Pujon. *Skripsi.* Universitas Negeri Maulana Malik Ibrahim, Malang

Dhini, N., Fridani, L., Yarmi, G., & Kusniaty. N. (2008). *Metode Pengembangan Bahasa.* Jakarta: Universitas Terbuka

Dyah, B., & Bandur, A. (2018). *Validitas Dan Reliabilitas Penelitian.* Mitra Wacana Media

Gu C, & Bi HY. (2020). Auditory processing deficit in individuals with dyslexia: A meta-analysis of mismatch negativity. *Neurosci Biobehav Rev*, 396-405, DOI: 10.1016/j.neubiorev.2020.06.032

Hulme C, & Snowling MJ. (2016). Reading disorders and dyslexia. *Curr Opin Pediatr*, 28(6):731-735. doi: 10.1097/MOP.0000000000000411

Insiyah, Wiryokusumo, I., & Fatirul, A. N. (2021). Pengaruh Scrabble Versus Petualangan Maharaja dan Motivasi Belajar terhadap Kemampuan Membaca Anak Disleksia. *Jurnal Visi Ilmu Pendidikan*, 13(2), 117. https://doi.org/10.26418/jvip.v13i2.42169

Magfiroh, N.L., & Bahrodin, A. (2022). Pengaruh Media Pembelajaran Flashcard terhadap Kemampuasn Anak Disleksia. Jurnal Inovasi Kurikulum. Vol, 19. No, 1. Hal, 69-78.

Martinez, M., Ramos, L., Callaway, K., Miller, K. (2014). The Dyslexia Handbook. Procedures Concerning Dyslexia and Related Disorders. Texas Education Agency. Austin, Texas

Munawaroh, M., & Anggrayni, N. T. (2015). Mengenali Tanda-Tanda Disleksia Pada Anak Usia Dini. Proseding Seminar Nasional PGSD UPY.

Mulyadi, & Nurhadayani, R. (2018). Meningkatkan Kemampuan Membaca Permulaan Melalui Media Flashcard pada Mata Pelajaran Bahasa Indonesia Bagi Siswa Kelas I SDN 35 Nungga Kota Bima. *Jurnal Pendidikan Bahasa*, 8(1), 6–18. http://www.ejournal.tsb.ac.id/index.php/jpb/article/view/94

Nation, Kate. (2019). Children's reading difficulties, language, and reflections onthe simple view of reading. *Australian Journal Of Learning Difficulties*, VOL. 24, NO. 1, 47–73, https://doi.org/10.1080/19404158.2019.1609272

Pangastuti, R. (2017). Pembelajaran Al-Quran Anak Usia Dini melalui Metode '"Wafa."' Annual Conference on Islamic Early Childhood Education, 2, 109–122. http://conference.uinsuka.ac.id/index.php/aciece/article/view/58

Puradireja, S.M. (2022). The Effectiveness of Flashcard Media and Letter Learning Applications to Help Dyslexic Children's Reading Ability in Elementary School. *Child Education Journal (CEJ)*, Volume 4, No. 1, 10.33086/cej.v4i1.2834

Reid, G. (2011). Dyslexia (Special Education Need). Continuum International Publishing Group. New York. https://doi.org/10.1111/j.1469-7610.2010.02312.x

Scaria LM, Bhaskaran D., & George B. (2023). Prevalence of Specific Learning Disorders (SLD) Among Children in India: A Systematic Review and Meta-Analysis. *Indian J Psychol Med*, 45(3), 213–219. https://doi.org/10.1177/02537176221100128

Snowling MJ., Hulme C., & Nation K. (2020). Defining and understanding dyslexia: past, present, and future. Oxford Review of Education, 46(4), 501-513, https://doi.org/10.1080/03054985.2020.1765756

Sohibun, & Ade, F. Y. (2017). Pengembangan Media Pembelajaran Berbasis Virtual Class Berbantuan Google Drive. *Tadris: Jurnal Keguruan Dan Ilmu Tarbiyah*, 2(2), 121. https://doi.org/10.24042/tadris.v2i2.2177

Sugiyono. (2017). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung : Alfabeta, CV

Sunanih. (2017). Kemampuan Membaca Anak Sekolah Dasar Kelas Rendah Bagian dari Pengembangan Bahasa. *NATURALISTIC : Jurnal Kajian Penelitian Pendidikan Dan Pembelajaran*, 2(1), 38–46. https://doi.org/10.35568/naturalistic.v2i1.89

Surkatiningsih, Wahyu. (2014). Peningkatan Kualitas Pembelajaran Membaca Dan Menulis Permulaan Di Kelas 1 Sekolah Dasar Melalui Media Kata Bergambar. Edustream: Jurnal Pendidikan Dasar. 5 (1).

Steven, E.A., Hall, C., Vaughn, S. (2022). Language and reading comprehension for students with dyslexia: An introduction to the special issue. *Annals of Dyslexia*, 72: 197–203. https://doi.org/10.1007/s11881-022-00260-6

Tambirajah, M.S. (2010). Developmental dyslexia: an overview. *Advances in psychiatric treatment*, vol. 16, 299–307 doi: 10.1192/apt.bp.108.006072

Wen, J. M., Do, H. D., Liu, E. Z. F., Lin, C. H., & Huang, S. K. (2020). Educational board game and flashcard: Which one is better for learners at beginner level of Chinese language? *International Journal of Serious Games*, 7(4), 89–104. https://doi.org/10.17083/ijsg.v7i4.347

Widyorini. E., dan Van Tiel. J. (2017). *Disleksia; Deteksi, Diagnosis, Penanganan di Sekolah dan di Rumah*. Jakarta. Penerbit: Prenada

Yusuf. S. (2007). *Psikologi Perkembangan Anak & Remaja*.Bandung. Remaja Rosdakarya.

Yuzaidey NAM, Din NC, Ahmad M, Ibrahim N, Razak RA, & Harun D. (2018). Interventions for children with dyslexia: A review on current intervention methods. *Med J Malaysia*, Vol 73 (5), 311-320